ward of the Yucatan Channel; however, no definite cyclonic development was indicated.

Fog.—July was foggier than normal over most northern portions of the North Atlantic. As a rule there was more fog than during the preceding month, and this was notably the case to northward of the 45th parallel between the 20th and 40th meridians. A decrease in fogginess from June to July is indicated for the area just to eastward of Chesapeake and Delaware Bays and also for the section a short distance to northwestward of the westernmost Azores.

The square of most frequent fog was in the Cape Cod-Maine-Nova Scotia region, where 23 days gave reports of fog. Next was a square at the southern tip of the Grand Banks, 40° to 45° N., 45° to 50° W., with 22 days. In that part of the Atlantic to eastward of the 40th meridian the foggiest square (45° to 50° N. and 25° to 30° W.) had 11 days. It was noteworthy that between the 40th meridian and Europe fog was seldom met after the 18th.

OCEAN GALES AND STORMS, JULY 1938

Vessel	Voyage		Position at time of lowest barometer		Gale began July—	Time of lowest barometer July—	Gale ended July—	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Caledonia, Br. S. S.	Glasgow	New York	55 13 N.	19 03 W.	3	Mdt, 3	4	29.60	W	W, 7	NW	NW, 8	W-WNW.
Black Hawk, Am. S. S.	Rotterdam	do	49 49 N.	12 16 W.	4	3p, 4	5	29.86	WNW	WNW, 6	WNW	WNW, 9	W-WNW.
Bilderdijk, Du. S. S.	do	do	49 41 N.	9 56 W.	4	8p, 4	5	29.77	W	W, 7	WNW	WNW, 8	W-WNW.
Hermes, Du. S. S.	Amsterdam	San Juan	43 43 N.	20 04 W.	5	2a, 6	6	29.77	WSW	WNW	NNW	NW, 8	WNW-NW.
Nemaha, Am. S. S.	Rotterdam	New Orleans	42 20 N.	18 00 W.	6	6a, 6	6	29.90	NW	NW, 10	NW	NW, 10	None.
City of Omaha, Am. S. S.	London	Tampico	45 06 N.	15 30 W.	6	11a, 6	6	29.65	NNW	WSW, 4	NNW	NNW, 8	SW-W.
Camito, Br. S. S.	Avonmouth	Jamaica	46 18 N.	16 18 W.	6	11a, 6	6	29.64	N	W, 4	N	N, 8	SSW-NNW.
Marguerite Finaly, Fr. M. S.	Hamburg	Aruba	48 30 N.	9 42 W.	7	2a, 7	8	29.52	N	N, 8	WNW	NNW, 8	N-NW.
Statendam, Du. S. S.	Rotterdam	New York	50 05 N.	8 58 W.	7	Noon, 7	8	29.29	S	NNW, 9	NW	NNW, 9	S-NNW.
American Shipper, Am. S. S.	Belfast	Boston	54 55 N.	17 00 W.	10	8p, 10	11	29.72	W	W, 8	W	W, 8	None.
Scanpenn, Am. S. S.	Copenhagen	Wilmington	56 02 N.	26 30 W.	12	6a, 13	14	29.39	WSW	W, 9	NW	WNW, 10	WSW-WNW.
Svanhild, Dan. S. S.	Aalborg	New York	58 30 N.	15 30 W.	13	11p, 13	14	[1] 29.17	S	SW, 7	WNW	WNW, 8	S-WNW.
Castilla, Hond. S. S.	Philadelphia	Barrios	20 08 N.	86 00 W.	31	6a, 31	31	29.94		E, 4		SE, 6	SE-E.
Cefalu, Hond. S. S.	Havana	Cristobal	20 12 N.	84 06 W.	30	7a, 31	31	29.97		ESE, 5		SE, 6	
NORTH PACIFIC OCEAN													
Hikawa Maru, Jap. M. S.	Vancouver, B. C.	Yokohama	43 50 N.	152 10 E.	1	10a, 1	1	29.21	SW	SW, 8	W	WSW, 8	SE-SW-WNW.
President Jefferson, Am. S. S.	Seattle	do	47 15 N.	163 45 E.	1	4a, 2	2	29.61	SE	SSE, 9	SSE	SSE, 9	SE-S.
Hoegh Hood, Nor. M. S.	Estero Bay	Kobe	35 00 N.	158 12 E.	8		8		S		S	S, 8	
Northland, U. S. C. G.			65 42 N.	169 00 W.	9	1p, 10	10	29.67	N	N, 5	N	N, 8	None.
Columbian, Am. S. S.	Los Angeles	Balboa	13 06 N.	93 18 W.	18	5p, 17	18	29.83	NE	SW, 1	NE	NE, 10	
Kaijo Maru, Jap. M. S.	do	Yokohama	37 42 N.	144 30 E.	25	5a, 25	25	29.72	ESE	SE, 8	SE	SE, 8	ESE-SE.
San Marcos, Am. S. S.	San Diego	Balboa	13 03 N.	93 17 W.	28	2a, 28	28	29.90	E	E, 2	E	E, 9	

[1] Barometer uncorrected.

NORTH PACIFIC OCEAN, JULY 1938

By WILLIS E. HURD

Atmospheric pressure.—Stable anticyclonic pressure conditions existed over middle latitudes on the eastern two-thirds of the North Pacific Ocean during the greater part of July 1938. Even in higher latitudes, extending well into the Bering Sea, the average barometer was unusually high, as may be observed in the accompanying table, and the Aleutian LOW, for the first time since August 1937, had become practically nonexistent.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, July 1938, at selected stations*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	29.80	−0.12	30.04	28	29.56	10
Dutch Harbor	29.99	+.05	30.34	30, 31	29.56	7
St. Paul	29.97	+.13	30.26	22	29.44	9
Kodiak	30.00	+.06	30.34	22	29.42	11
Juneau	30.07	+.02	30.45	23	29.72	9
Tatoosh Island	30.09	+.04	30.29	18	29.79	25
San Francisco	29.97	+.02	30.14	4	29.81	23
Mazatlan	29.90	+.04	29.98	1	29.78	7
Honolulu	30.02	.00	30.11	19	29.94	31
Midway Island	30.14	+.03	30.27	11	30.00	1
Guam	29.81	−.03	29.94	3	29.71	14, 15
Manila	29.78	+.04	29.89	7	29.71	4, 27
Hong Kong	29.70	+.05	29.82	7	29.52	4
Naha	29.79	+.07	30.00	6	29.53	30
Titijima	29.85	.00	30.09	4	29.56	13
Petropavlosk	29.88		30.18	11	29.53	21

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

While low pressure conditions prevailed over western Mexico and the adjoining west coast, and in the Far East, average pressures in these regions, except at Guam, were normal to slightly above.

Extratropical cyclones and gales.—While several low pressure areas crossed northern waters of the North Pacific during July 1938, none was very active, and no gales were reported for the entire region east of the 170th meridian of east longitude, except in the Tropics and in Bering Strait.

In middle and higher east longitudes gales were few in number and occurred within the region 35° to 48° N., 144° to 165° E. These gales, of force 8 to 9, were experienced on the 1st, 2d, 8th, and 25th. That of the 1st, of force 8, barometer 29.21, to the immediate southward of the Kuril Islands, was in connection with the deepest cyclone of record during the month.

Tropical cyclones and gales.—On the 18th and 28th of July strong to whole gales were reported south of the Gulf of Tehuantepec, both near 13° N., 93° W. The former, of force 10 from the northeast, lowest barometer 29.83, was encountered by the American steamer *Columbian;* the latter, of force 9 from the east, barometer 29.90, was experienced during the early morning by the American steamer *San Marcos.* The gale of the 18th appeared to be due only to locally squally conditions; that of the 28th, to a probable cyclonic disturbance, central, according to the Mexican Meteorological Service, to the southward.

Several tropical LOWS appeared in the Far East, but we have no present information that they were severe.

The French motorship *Jean Laborde*, in the China Sea on July 7, reported the existence of a typhoon about 150 miles east of Tourane moving northwestward. Our weather maps show the presence of a rather deep LOW in the same vicinity on the 23d. The British motorship *Taybank*, east of the central Philippines on the 16th to 18th, reported a typhoon in the vicinity.

Fog.—There were some 6 to 8 or more days with fog along most parts of the northern sailing routes to the westward of about 150° west longitude extending almost to the Japanese coast. The Norwegian motorship *Ringwood*, Yokohama toward Portland, Oreg., July 4–14, reported "dense fog and fog patches, sometimes wet and sometimes dry, during the whole voyage," with "intervals between the patches not exceeding 4–5 hours." No fog was reported off the Washington and Oregon coasts, but it was observed on the 11th, 12th, and 31st between Point Conception and San Pedro, and on the 14th and 17th off Lower California. In the Bering Sea, between St. Paul and Dutch Harbor, 9 days, from the 6th to 18th, were reported with fog.

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

TABLE 1.—*Condensed climatological summary of temperature and precipitation by sections, July 1938*

[For description of tables and charts, see REVIEW, January, p. 29]

Section	Temperature								Precipitation					
			Monthly extremes								Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	80.4	+0.1	4 stations	101	[1] 4	5 stations	60	1	7.54	+2.18	Citronelle	13.37	Wheeler Dam	3.14
Arizona	79.2	−.9	Quartzsite	119	31	Bright Angel R. S.	31	5	1.54	−.71	Bisbee	6.37	3 stations	T
Arkansas	82.0	+1.5	Hot Springs	109	13	2 stations	59	[1] 4	3.74	−.06	Corning	12.90	Arkansas City	.65
California	73.0	−.6	Cow Creek	125	21	Ellery Lake	26	4	.15	+.08	Twin Lakes	2.50	119 stations	.00
Colorado	67.2	+.1	2 stations	108	[1] 9	Dillon	22	7	1.67	−.53	San Isabel	8.93	Fruita	T
Florida	80.2	−1.1	Niceville	100	3	3 stations	60	[1] 1	8.49	+1.25	Sarasota	18.78	Fernandina	2.30
Georgia	78.8	−1.3	2 stations	102	[1] 9	Blairsville	47	1	7.57	+1.80	Blairsville	14.91	Warrenton	2.89
Idaho	68.2	+.1	Lewiston	113	[1] 22	Pelton Ranch	28	4	1.14	+.47	Hailey	2.98	Kellogg	.08
Illinois	77.1	+.6	Greenville	103	11	Dixon	50	21	4.74	+1.46	Mt. Carmel	12.12	Mt. Vernon	1.63
Indiana	75.6	−.1	Elliston	105	11	Salamonia	50	5	5.25	+1.89	La Porte	10.84	Anderson	2.06
Iowa	76.5	+1.9	Omaha	107	11	Sibley	48	23	4.24	+.57	Sac City	12.02	Tingley	.52
Kansas	80.9	+1.8	2 stations	110	[1] 2	Garden City	50	23	2.90	−.29	Atchison	7.56	Minneola	.50
Kentucky	77.2	.0	do	100	[1] 10	Danville	52	2	7.27	+3.10	Quicksand	15.43	Monticello	3.01
Louisiana	81.9	+.1	Calhoun	105	5	Franklinton	60	1	6.17	+.03	Delta Farms	14.49	Natchitoches	1.00
Maryland-Delaware	75.9	+.6	Cumberland, Md.	99	8	2 stations	42	5	7.33	+3.11	Crisfield, Md.	15.04	Woodstock, Md.	3.75
Michigan	69.4	+.3	2 stations	94	7	Dukes	31	21	2.66	−.24	Coldwater	6.94	Mackinac Island	.56
Minnesota	70.3	+.3	do	100	12	2 stations	38	26	3.30	+.01	Rochester	9.66	Pigeon River Bridge	1.11
Mississippi	82.0	+.9	do	103	[1] 4	Shubuta	60	5	5.39	+.36	Pearlington	12.29	Batesville	1.41
Missouri	79.7	+1.7	Unionville	110	12	4 stations	53	[1] 15	3.50	−.19	New Madrid	9.49	Galena	.37
Montana	67.3	+.4	Libby	104	22	Summit	32	[1] 26	2.09	+.61	Lustre (near)	4.96	Heron	.02
Nebraska	77.2	+1.8	Benkelman	111	[1] 10	Mullen	45	[1] 8	3.23	+.08	Madison	8.47	Lyman	.44
Nevada	72.5	.0	Las Vegas Airport	115	31	Sheldon	33	5	.76	+.37	Gerlach	2.37	3 stations	T
New England	69.7	+.6	Falls Village, Conn.	95	7	Somerset, Vt.	38	[1] 7	7.75	+3.99	Milford, Mass.	14.52	Nantucket, Mass.	2.00
New Jersey	74.7	+1.0	Bridgeton	98	10	2 stations	43	[1] 3	8.84	+4.05	Long Branch	16.17	Little Falls	6.29
New Mexico	70.7	−1.5	Orogrande	104	[1] 7	Elizabethtown	27	6	2.31	−.21	Clouderoft	8.06	Shiprock	.00
New York	70.8	+1.1	2 stations	96	[1] 8	Indian Lake	35	3	5.11	+1.19	Boyds Corners	12.22	Utica	1.79
North Carolina	75.7	−1.2	do	99	[1] 11	Mt. Mitchell	41	1	7.75	+1.87	Rock House	17.89	Hatteras	1.90
North Dakota	69.7	+.9	McClusky	104	31	2 stations	39	25	3.34	+.90	Maddock	6.73	Timmer	.91
Ohio	74.2	+.5	Gallipolis (near)	99	8	3 stations	48	[1] 3	4.99	+1.17	Portsmouth No. 2	11.76	Norwalk	1.50
Oklahoma	82.3	+.5	Hollis	109	13	2 stations	54	10	2.63	−.23	Hugo	8.21	Oakwood	.40
Oregon	68.1	+1.6	Umatilla	112	21	Chemult	23	5	.51	+.10	Enterprise	2.02	4 stations	T
Pennsylvania	73.2	+1.0	Marcus Hook	100	10	Coudersport	40	[1] 5	4.81	+.52	Ardmore	11.26	Lock No 2	.97
South Carolina	78.4	−1.6	Lake City	101	10	Long Creek (near)	50	1	6.90	+1.06	Long Creek (near)	13.18	Little Mountain	2.78
South Dakota	74.6	+1.6	Pukwana	108	12	2 stations	45	[1] 8	2.04	−.41	Vermillion	5.63	Faulkton	.63
Tennessee	78.2	+.5	2 stations	101	[1] 6	Gatlinburg	52	1	6.37	+1.88	Waynesboro	14.19	Covington	.50
Texas	82.9	−.1	do	110	[1] 6	2 stations	52	[1] 8	3.43	+.80	Sloan	22.58	6 stations	.00
Utah	70.0	−1.7	do	107	31	do	28	[1] 6	.67	−.26	Park Valley	2.51	2 stations	.00
Virginia	75.4	.0	Lincoln	101	10	Big Meadows	48	4	7.20	+2.65	Christchurch	15.09	Mount Weather	1.96
Washington	69.2	+2.9	Hanford	114	22	2 stations	32	[1] 4	.36	−.34	Mt. Baker Lodge	1.58	6 stations	.00
West Virginia	73.6	+.4	Inwood	103	11	Bayard	37	5	5.58	+.99	Rowlesburg	11.50	Dam 13, O. R.	1.16
Wisconsin	70.1	.0	Eau Claire	95	12	Laona	35	15	4.41	+.87	Deerskin Dam	10.14	Plum Island	.87
Wyoming	65.0	−.6	Casper	105	11	Fox Park	28	8	1.70	+.35	Spencer (near)	4.52	Elk Mountain	.13
Alaska (June)	51.3	−1.1	Richardson	95	27	Barrow	18	10	2.52	+.82	Cordova	17.03	Kotzebue	T
Hawaii	74.9	+.8	3 stations	92	[1] 15	Kanalohuluhulu	47	4	4.71	−1.12	Hilo-Manawaiopuna Divide	19.50	6 stations	.00
Puerto Rico	78.0	−.3	Juncos	97	6	Garzas	56	7	4.55	−1.62	La Mina (El Yunque)	11.91	Ensenada	.81

[1] Other dates also.